



SAND CREEK MASSACRE

Vegetation Inventory

Source: R. L. Roath, R. Ridenour, B. Wesley, and
Z. Holmes, Colorado State University

PROJECT SUMMARY

Introduction and Background

In 2007, Colorado State University completed an intensive inventory and analysis of vegetation in the Sand Creek Massacre National Historic Site for the Southern Plains Inventory and Monitoring Network. The study measured and analyzed the composition of plant species and ground cover and included photographic documentation. The study provides baseline biological information about the site's vegetation which may be used to better understand the ecological health of the park and as a foundation for management decisions. This assessment supports the site's requirement to preserve the cultural landscape of the site as closely as reasonable to its appearance at the time of the massacre in 1864.

Methods

The current ecological status of the site's vegetation communities were classified based on the USDA Natural Resources Conservation Service's (NRCS) Ecological Site Descriptions.



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Sites have distinct characteristics, including vegetation, climate, soil, water, and surface features. Ecological Site Descriptions identify the dynamics of an area, successional stages of plant communities, and disturbances that cause transitions to a successive or seral stage. The descriptions include an account of the Historical Climax Plant Community (HCPC), or the plant community which existed in North America at the time of European immigration and settlement. This plant community was adapted to the unique combination of environmental factors associated with the site.

Current plant communities were classified relative to the site's historical vegetation composition using the Ecological Site and HCPC descriptions. Park managers can use this information to determine the presence of plant species and the composition of current plant communities, which may be used to shift communities to the nearest reasonable resemblance of historic conditions. Ecological site boundaries of the Sand Creek Massacre site were defined using the NRCS Ecological Site Descriptions and adjusted to include soil survey data from existing maps. Sites were classified into 33 community types, or community strata. Community strata were further categorized into 16 seral strata, or community types of the same successive stage and Ecological Site.

Vegetation was sampled for abundance or frequency and ground cover (e.g., living plants, litter, bare ground, rock). A sampling plot and site were photographed in each community strata. Average relative frequency of species in each community and seral strata was calculated.



Poison milkweed (*Asclepias subverticillata*).

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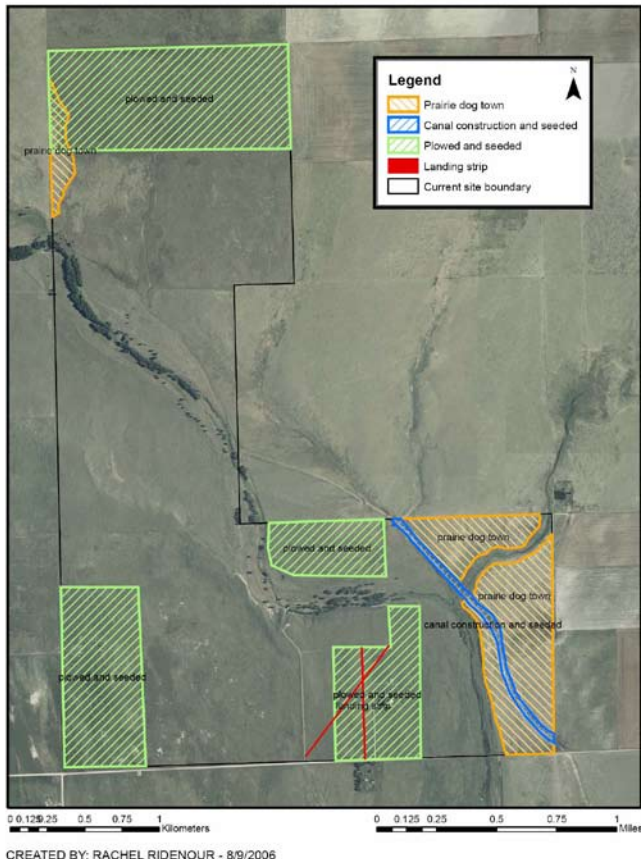
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Plant communities in Sand Creek Massacre NHS are not at their ecological potential.

Results

The Sand Creek Massacre site is a combination of sandhills, mixed grass prairie, a highly productive shortgrass prairie which transitions into a loamy mixed grass prairie, and wetlands with many seral strata. Soil texture ranges from sandy to loamy, many bottomland areas are saline. Plant communities are not at their ecological potential. The majority of inventoried sites were composed of early to mid-plant communities and showed major effects of disturbance. Key species were



Areas of major disturbance in Sand Creek Massacre NHS.

not documented in most plant communities and contained an overabundance of low seral forbs and annual plants when compared with a site's HCPC.

Key species, such as big bluestem (*Andropogon gerardii*), green needlegrass (*Nessella viridula*), fourwing saltbush (*Atriplex canescens*), and western sandcherry (*Prunus pumila*) were not observed during the study. Most areas were dominated by blue grama (*Bouteloua gracilis*), sand dropseed (*Sporobolus cryptandrus*), and sagebrush (*Artemisia* spp.). Up to two feet of Russian thistle (*Salsola* sp.) litter were documented along many low lying areas and a large monoculture of poison milkweed (*Asclepias* spp.) was documented along the Big Sandy Creek channel.

Discussion

Historic disturbances and drought affect vegetation composition of the Sand Creek Massacre site. These disturbances include livestock grazing, agriculture, and construction of a canal and airport landing strip and are reflected in the results of this inventory. The study related the high occurrence of low seral plant species primarily to drought and historic disturbance. It is likely that annual plants will quickly diminish as a more normal rainfall pattern returns. However, areas of intense disturbance, such as fields that have not been replanted with perennial native grasses, will likely continue to be dominated by annual species indefinitely. Areas that have been replanted, but with nonnative species, may persist indefinitely.

Literature Cited

Roath, L. R., R. Ridenour, B. Wesley, and Z. Holmes. 2008. Vegetation inventory, Sand Creek Massacre National Historic Site: A report for the Southern Plains Network. Corrected final report. Fort Collins, CO: National Park Service, Natural Resource Program Center.

Project Contact

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Green needlegrass
(*Nessella viridula*)



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